

# ICT Experience Prototyping in practice: Artefact Transitions

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## Abstract

User-Centered Design (UCD) is proposed in literature as an ideal engineering method to guarantee the usability of interactive systems. In practice, however, most enterprises are rather sceptical about the benefits of UCD for in-house or outsourced developments, e.g. due to perceived complexity, duration and cost of the UCD approaches. In this paper, we describe the actual lessons learnt after collaboration with companies, where these correspond to UCD promises, and which methodological gaps we discovered when carrying out the experience prototyping cases.

## Introduction

In literature, UCD approaches are suggested to guarantee the usability of software products [1]. In practice, on the other hand, most companies have no trust in methodologies which, at first sight, seem more time-consuming and expensive than the methodologies used in traditional software engineering. Although usability is more and more used as one of the most important design criteria, we observed a lack of understanding to implement this approach in the field.

In the context of the applied research project *Virtual ICT Experience Prototyping lab*<sup>1</sup>, we collaborate with companies in the region in order to show the benefits of the UCD approach by carrying out case studies in different application domains and industrial brands [2]. Buchenau & Fulton Suri [3] explain experience prototyping as the experiential aspects of whatever representations are needed to successfully (re)live or convey an experience with a product, space or system. The basic idea of UCD is to involve target users from the beginning of the design process to make sure the final interface satisfies the users' requirements. A multi-disciplinary team ensures the whole user experience, including likeability, sociability, playability, accessibility,... is taken into account, and stimulates the communication with different stakeholders such as target users, company representatives, designers/developers and in our case also academic researchers.

## An Agile Process: UCD with Experience Driven Techniques

The aim of the case studies is to design a prototype, which is relevant for the sector. The case studies cover a wide variety of target sectors, such as health and e-government applications among others. This variation gives us the opportunity to assess that Experience Prototyping can be used in the design of interactive systems for different types of user groups.

Our overall approach is structured as follows: from the beginning, stakeholders are involved in defining the concepts and requirements for the interactive system. A user and task analysis are carried out, traditionally accompanied by the creation of mockups that can be used to verify whether the designs are consistent with the users' mental model. Different stages of prototyping are used next, each prototype being a higher level prototype than its predecessor and gradually coming closer to the final user interface. This approach clearly requires smooth transitions between different artefacts, thus ensuring that the captured information in one design artefact is still valid for the next one, and that prevents degradation of the interface with respect to the aforementioned factors (usability, likeability,...)

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<sup>1</sup> VIP-lab is an Interreg project, more information about the project is available at [www.vip-lab.org](http://www.vip-lab.org)

In general, the overall approach for each case is the same, but based on former experiences, the techniques used to gather information can be quite different. An agile process is clearly required: depending on the target user group the emphasis, duration and methods used can differ while the overall approach stays the same.

Although the techniques we use in the overall approach are well-known and described in literature, there still occur some difficulties in the Experience Prototyping process. There is no straightforward solution in literature to manage the transitions between the general stages if the specific implementations of the stages are different. While transformations take an important role in model-based UI development and model-driven engineering in the broad sense, as far as the transformation rules are defined in these domains, these principles have not yet been integrated with UCD approaches. So how can we make for example the transition from requirements, scenarios and personas to low-fidelity prototypes, or how can a low-fidelity prototype evolve in a controlled way into high-fidelity prototypes and software development? Additional research is needed to identify the problems as well as solutions related to these transitions. For the moment being we cope with these uncertainties using previous experiences from other cases as some sort of “best practice”.

### **From user and task analysis to low-fidelity prototype**

One of the case studies in the VIP-lab project is concerned with developing a flexible user interface for mobile journalists that allows them to write a news story and send it to the editors, accompanied by one or more pictures. In close cooperation with Concentra, a media concern, a user and task analysis was carried out in the field involving journalists and photographers. Our experiences in this case have confirmed that a multidisciplinary team is extremely valuable when practising a UCD approach. The team consists of researchers with a background in human sciences (specialized in user research) and others working in the field of exact sciences (specialized in technical research and interactive software development). The different backgrounds of the researchers and the company / user representatives involved in the UCD process raise the need for clear communication to avoid misunderstanding. However, the explicit awareness of subtle differences in interpretation has spontaneously structured our approach when transforming user and task analysis results to prototypes. Agreement on the meaning and future importance of things preceded design steps, and introduced priorities. The mockups, developed when discussing analysis results, have been an explicit communication medium in the team and gradually evolved towards the prototyping levels.

### **Conclusion**

In this paper we have described the application and refinement of existing User-Centered Design techniques in the practical cases of the VIP-lab project. From these experiences, we conclude that multi-disciplinary teams add value to the industrial projects in which company representatives take part. When defining the transitions between subsequent artefacts of the UCD approach, we discovered the need for particular attention in future research to these transitions, in order to come to a structured approach that complements transitions based on designers’ experiences. When using a task analysis notation (e.g. ConcurTaskTrees), there already exist guidelines to proceed from the task specification to prototypes. Often, iterative refinement of the task specification is interleaved with revisiting and completing the corresponding prototypes, allowing hand in hand evolution of both types of artefacts.

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